SRD991 Intelligent Positioner with HART, PROFIBUS-PA, FOUNDATION Fieldbus H1 or Without Communication

The intelligent positioner SRD991 is designed to operate pneumatic valve actuators and can be operated from control systems (e.g. the Foxboro I/A Series System), controllers or PC-based configuration- and operational tools such as FDT/DTM Software. The positioner is available with different communication protocols. The multi-lingual full text graphical-LCD in connection with the 3 push buttons allows a comfortable and easy local configuration and operation. For installations in contact with explosive atmospheres, certificates are available.

**DEVICE FEATURES**

**Intelligent**
- Auto-start with self-calibration
- Self diagnostics, status- and diagnostic messages
- Easy operation with three key pads
- Multi-Lingual full text graphical LCD
- VALcare™ or Valve Monitor DTM for valve diagnostics and predictive maintenance

**With communication**
- HART, FOUNDATION Fieldbus H1, PROFIBUS-PA
- Configuration by means of local keys, handheld terminal (HART), PC with FDT-DTM or I/A Series system

**Without communication**
- Input signal 4 to 20 mA

**COMMON FEATURES**

- Stroke 8 to 260 mm (0.3 to 10.2 in) with standard lever; larger stroke with special lever
- Angle range up to 95° (up to 300° as option)
- Supply air pressure up to 6 bar (90 psig), with spool valve up to 7 bar (105 psig)
- Single or double-acting
- Mounting on linear actuators according to NAMUR – IEC 50534-6-1 – VDI/VDE 3847
- Mounting on rotary actuators acc. to VDI/VDE 3845 or IEC60534-6-2
- Protection class IP 66 and NEMA 4X
- Approved for SIL applications
- Explosion protection: Intrinsic safety according to ATEX / IECEx, FM, CSA, INMETRO, NEPSI, EAC, ...

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Electronics version:
Communication HART, PROFIBUS PA, FOUNDATION Fieldbus
or "without communication"

G 1/4

Manifold Booster

Option boards "Additional i/o"

Service plug

Limit signal switch

Pressure sensors

Cable glands
OVERVIEW

The SRD991 consists of a basic device with a digital controller that supports different communication protocols (or also simply 4-20 mA input). Into this basic device, additional equipment can be built such as plug-in cards for electrical input/output signals, position feedback and pressure sensors.

The pneumatic part is available in different versions (single / double acting or spool valve). For very large actuators, boosters with increased air capacity can be flanged on. Also, different manifolds for connection of gauges can be flanged on. For the pneumatic screw connections, we offer different threads in the housing and adapters.

For use in hazardous areas, there are approvals according to ATEX / IECEx, FM, CSA, EAC, NEPSI, etc.

The device can be configured locally by means of push buttons and LCD / LED, or with PC + EDC82 Modem connected to the service plug of the SRD991. By means of communication, the device can be configured remotely via FDT/DTM.

A large variety of attachment kits for all common valves and actuators are available. The list “AttachmentKits.pdf” is updated continuously and can be found on the Internet.

For high temperature or high vibration application, we recommend to mount the SRD991 remotely and not directly on the valve. For this, use the potentiometer unit (like the SRI990 - TXQxxxxx - H).

Please consult TI EVE0105 R for specifications.

To ensure the high performance of the positioner, we offer Advanced Diagnostics and Premium Diagnostics utilities:

<table>
<thead>
<tr>
<th></th>
<th>Premium Diagnostics</th>
<th>Advanced Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autostart</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Custom Characterization</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Autodiagnostic</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Alarm Management</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Alarm Output for Switching (with Optionboard)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Status List acc. NE107</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Position History</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Response History</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>On Line Friction</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Stepping Signature</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Ramping Signature</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Sensitivity Signature</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Valve Signature</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>PST (Partial Stroke Test)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>PST Predictive Maintenance</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Additional equipment, built into the basic device:

<table>
<thead>
<tr>
<th></th>
<th>Premium Diagnostics</th>
<th>Advanced Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Board “2 Binary Inputs”</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Option Board “2 Binary Inputs/Outputs”</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Option Board “Position Feedback”</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Limit switch</td>
<td>T,U,V</td>
<td></td>
</tr>
<tr>
<td>Pressure sensors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Accessories like Manifolds and Boosters see page 24.
Special Versions of SRD991:

**SRD991 Stainless Steel Housing**
To be order with model code SRD991-xxxxxxxx-Zxxx

Please consult TI EVE0105 INOX for specifications.
For dimensional drawings see page 33.

**SRD991 for Top Mounting onto small actuators**
This version is designed for direct mounting on top of small actuators without yoke - solution for actuators up to 50 mm stroke.
Instead of the rotary potentiometer, a linear pot is used that feeds back the actual position of the actuator.

The Model Code of this basic device is SRD991- ............ -W

The adapter part is dependent on the manufacturer and type of actuator and can be ordered under the code EBZG-TMxx.
Please consult TI EVE0105 TM for specifications.

**SRD991 designated for PST (Partial Stroke Test for Emergency Shut Down)**
Final control elements in Emergency Shutdown (ESD) applications such as ON-OFF-, Blow Down and Venting valves remain in one position over a long time without any mechanical movement. These valves can show a tendency to get stuck and as a result might not operate upon demand. This can have a severe impact on the functionality of a Safety System and could result in an adverse condition to the operating personnel, plant equipment and the environment. The Partial Stroke Test (PST) offers operators a tool to identify the troubleshooting function of ESD valves. The test can be easily executed via the FDT-DTM based configuration diagnostic tool VALcare™/Valve Monitor.

**SRD991 for actuator with rotation up to 300°**
This special version of the SRD991 is designed to be mounted by means of standard attachment kit (like the EBZG-R) onto rotary actuator with rotation up to 300°. This special version is made of a standard SRD991 with special gears.

To be ordered under Options -J.
Please consult TI EVE0105 LR.
FUNCTIONAL SPECIFICATIONS  (common data for all versions)

Travel range
Stroke range . . . . . . . . . . . . . 8 to 260 mm (0.3 to 10.2 in) with standard feedback levers; special levers on request
Rotation angle range . . . . . . . up to 95° without mechanical stop; up to 300° with Option ~J.

Supply
Supply air pressure . . . . . . . 1.4 to 6 bar (20 to 90 psig) with spool valve
Output to actuator . . . . . . . 0 to ~100 % of supply air pressure (up to 5.5 bar at 6 bar supply air pressure) with spool valve heavy duty
Air supply . . . . . . . . . . . . . . according to ISO 8573-1
- Solid particle size and density class 2
- Oil rate . . . . . . . . . . . . . . . class 3
- Pressure dew point 10 K under ambient temperature
The use of filter regulator for air supply of positioner is strongly recommended. It reduces the air pressure to actuator's maximum pressure and keeps it constant.

For supply with Natural Gas instead of compressed air please consult TI EVE0105 G.

Air output ln/h (scfh)
at max. deviation, single and double acting:

<table>
<thead>
<tr>
<th>Supply air pressure bar (psig)</th>
<th>1.4  (20)</th>
<th>3   (45)</th>
<th>6   (90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Amplifier</td>
<td>2 700</td>
<td>5 000</td>
<td>7 500</td>
</tr>
<tr>
<td>with Spool Valve 1)</td>
<td>6 000</td>
<td>12 000</td>
<td>18 000</td>
</tr>
</tbody>
</table>

‘Heavy duty’ spool valve 2) is able to deliver up to 55,000 ln/h at 10 bar. Please consult TI EVE0105 INOX.

Note: The use of boosters in connection with Spool valve is not recommended.

Air consumption (steady state) ln/h (scfh)

<table>
<thead>
<tr>
<th>Supply air pressure bar (psig)</th>
<th>1.4  (20)</th>
<th>3   (45)</th>
<th>6   (90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>single acting</td>
<td>80  (2.8)</td>
<td>130</td>
<td>220</td>
</tr>
<tr>
<td>double acting</td>
<td>130</td>
<td>230</td>
<td>430</td>
</tr>
<tr>
<td>Spool Valve</td>
<td>100</td>
<td>240</td>
<td>500</td>
</tr>
</tbody>
</table>

Response characteristic 3) 4)
Sensitivity . . . . . . . . . . . . . . . . . . . < 0.1 % of travel span
Non-linearity (terminal based adjustment) . . . . . . < 0.4 % of travel span
Hysteresis . . . . . . . . . . . . . . . . . . . < 0.3 % of travel span
Supply air dependence. . . . . . < 0.1 % / 1 bar (15 psi)
Temperature effect. . . . . . . . . . . < 0.3 % / 10 K
Mechanical vibration
10 to 60 Hz up to 0.14 mm,
60 to 500 Hz up to 2 g . . . . . . . . . < 0.25 % of travel span

Volume Booster Series (to order as accessory)
For large actuators or to reduce action time, a volume booster may be necessary.

VBS100 / VBS110
Volume boosters with Cv1 and pneumatic connection 1/4”, for remote mounting
VBS100 in Aluminium, VBS110 in Stainless Steel 316

For more information please consult PSS EVE0601.

VBS200 / VBS201 / VBS202
Volume booster with Cv 2 and pneumatic connection 1/2”, for direct side mounting to positioner, remote mounting, or mounting acc. to VDI/VDE 3846

For more information please consult PSS EVE0602.

VBS300 / VBS310
Volume boosters with Cv7 and pneumatic connection 1”, for remote mounting
VBS300 in Aluminum, VBS310 in Stainless Steel 316

For more information please consult PSS EVE0603.

1) Spool valve is the type of amplifier used in device SRD991-Cxxxxx-S
2) Spool valve heavy duty is the amplifier used in stainless steel version SRD991 - Cxx... - SZK
3) Data measured according to VDI/VDE 2177
4) With stroke 30 mm and lever length 90mm
FUNCTIONAL SPECIFICATIONS (common data for all versions)

Features
Automatic start-up . . . . . . . (Autostart functionality)
Automatic determination of the mechanical end positions of
the valve (initial value and final value), IP motor parameters,
direction of action of the spring and control parameters.
The control parameters are optimized dynamically during
this routine.
This procedure makes a perfect adjustment and optimiza-
tion to the actuator possible without additional manual
settings! Several autostart modes are available (details see
on next page).

Options
• Built-in independent inductive limit switches
• Pressure sensors for monitoring of air supply and out-
put pressure (y1)
• Additional inputs / outputs:
  • Position feedback 4-20 mA + binary alarm
    output, to be supplied external
  • 2 binary outputs (position alarms)
  • 2 binary inputs, to be supplied external
  • 2 contact inputs, internal supplied
  • 2 binary in-/outputs, to be supplied external

Operation and Configuration
The local LCD enable a fast and easy configuration as well
as diagnostic.
Local . . . . . . . . . . . . . . . . . . with local key pads
Display . . . . . . . . . . . . . . . . . . Multi-lingual Graphic LCD,
some versions with 5 LEDs

The positioner in the version with LCD contains three
different menu languages. Standard menu languages:
- English
- German
Freely selectable third language:
- French - Portuguese - Spanish
- Italian - Swedish - ...
(further menu languages see Model Code page 23).
The third menu language has to be selected and specified
with the order, otherwise standard: French.
The third, freely selectable menu language can be modified
to another language by means of the VALcare™ DTM.
The additional languages can be downloaded from our
homepage.

Diagnostics
• Shows condition of device:
  • Potentiometer
  • IP Motor
  • Exceeding range of actuator (possible indication for wear
    of plug or seat)
  • Remaining control deviation (possible indication for jam-
    med actuator, blocked valve stem or plug, insufficient
    air capacity /supply air pressure (positioning pressure)
  • If equipped with pressure sensors (optional, see page 3):
    • Monitoring of the stem friction
    • Histograms for displaying the friction-history over time
  • Surveillance of air supply and output pressure, each with
display of physical value
  • Additional diagnostic possibilities in control operation by
means of external sensors (optional).
See also the VALcare™ Documentation.

Service plug
All basic devices are equipped with a service plug A at the
front side. There via RS232 interface a PC with VALcare
(DTM) can be connected via modem EDC82 (galv. separa-
ted, not Ex).
Information about EDC82 modem see TI EVE0102 Y.

2) With the versions “Intelligent without communication” this is
   only possible with modem EDC82
3) By means of “Additional inputs / outputs”
4) For the SRD991 without communication the use of the service plug is
   necessary to have access at the diagnostic with DTM
Manual local and remote settings:
Actuator mode . . . . . . . . . . . linear or rotary actuator
Linear valve . . . . . . . . . . . left or right mounted
Rotary actuator . . . . . . . . . opening clockwise or counter-clockwise
Characteristic of setpoint . . . linear, equal percentage, invers-equal percentage or custom (22 points)
Valve function . . . . . . . . . opens or closes with increasing setpoint
Split range . . . . . . . . . . . . free upper and lower values
Travel limits . . . . . . . . . . . free upper and lower values
Cutoffs . . . . . . . . . . . . free upper and lower values
Stroke range . . . . . . . . . . . configurable
Temperature unit . . . . . . . configurable (°C or °F)
Autostart . . . . . . . . . . . . Endpoints
- Standard Autostart
- Enhanced Autostart
- Smooth response
- Fast response
Control parameters . . . . . Determined during Autostart.
Working range . . . . . . . . . . freely adjustable (for indication on LCD)
Manual adjustment of . . . . P-gain, l-time,
T63-time and dead band
Manual operation . . . . . . . . Manual input of setpoint to drive the valve in steps of 12.5%, 1% or 0.1%
Pneumatic test . . . . . . . . . . . Function to test the pneumatic output
Workshop . . . . . . . . . . . . . input and angle calibration
LCD language . . . . . . . . . . . dependent on version
LCD orientation . . . . . . . . . dependent on version
PROFIBUS-PA . . . . . . . . . . . Bus address
FOUNDATION Fieldbus . . . . . Simulation
Switch from Link Master to Basic Field Device

Software supported configurations:
- By means of Hand Held Terminal (HART)
- PC by means of VALcare Software
- I/A Series System, Foxboro Evo and other DCSs

Failure handling
In case of Single Acting, Safety position at
- Air supply failure . . . . . . pressure y1 = zero
- Electric power failure . . . pressure y1 = zero
- Failure of electronics . . . pressure y1 = zero

In case of Double Acting or spool valve amplifier, safety position at
- Air supply failure . . . . . . pressure y1 = zero / y2 = zero
- Electric power failure . . . pressure y1 = zero / y2 = full air supply pressure
- Failure of electronics . . . pressure y1 = zero / y2 = full air supply pressure

For all types of amplifiers (with FF H1 or Profibus PA)
- Failure of communication is recognized by configurable watch dog with response delay of 0.1 s to 24 h
Behavior . . . . . . . . . . . . . configurable as
- pressure y1 = zero or
- stop at last value or
- a configured value
Diagnostic report . . . . . . . via communication and local LCD
- Historical status . . . . . . . is set if alarm was activated at any time (also just short alarms)
Reset . . . . . . . . . . . . . . . . by acknowledging

Spool Valve Amplifier for single and double acting application
Spool valve amplifier as option for the SRD991 can be used with double acting actuator and also with single acting actuator.
In case of single acting application, one of the pneumatic output must be closed:
- If y1 is used, y2 is closed and failure handling for Electric power failure and Failure of electronics becomes y1=zero.
- If y2 is used, y1 is closed and failure handling for Electric power failure and Failure of electronics becomes y2=full air supply.
FUNCTIONAL SPECIFICATIONS (common data for all version)

Mounting
Attachment to stroke actuators
- direct, FlowPak/FlowTop ... with attachment kit EBZG –E
- for casting yoke
acc. to IEC 534-6 (NAMUR) with attachment kit EBZG –H
or –H1
- for pillar yoke
acc. to IEC 534-6 (NAMUR) with attachment kit EBZG –K
or –K1

Stroke range with feedback lever:
- standard (EBZG-A)  8 to 70 mm / 0.31 to 2.76 in
- extended (EBZG-B) 60 to 120 mm / 2.36 to 4.72 in
- extended (EBZG-A1) 110 to 260 mm / 4.33 to 10.24 in
Larger stroke ranges can be realised with special levers.

Attachment to rotary actuators
acc. to VDI/VDE 3845 ...
with attachment kit EBZG –R
- Further attachment kits see ModelCodes page 26
- Mounting orientation see attachment dimensions starting from page 27

Materials
Housing and covers . . . . . . . Aluminum (Alloy No. 230)
finished with DD-varnish
All moving parts of feedback system . . . . . . . 1.4306 / 1.4571 / 1.4104
Attachment kits . . . . . . . . . . V4A or Aluminum, finished with DD varnish
(depending upon version) . . . . (Alloy No. 230)
Mounting bracket . . . . . . . . . Aluminum (Alloy No. 230)
Pneumatic diaphragms . . . . . . . . PVMQ (Silicone elastomer suitable for use in the paint industry)

Weight
Single acting . . . . . . . . . . . . approx. 1.7 kg (3.7 lbs)
Double acting . . . . . . . . . . . . approx. 2.0 kg (4.4 lbs)

Pneumatic connection
NAMUR mounting . . . . . . . . G 1/4 for pipe diameter 6 to 12 mm (0.24 to 0.47 in) for air supply and outputs y1, y2 to the actuator; 1/4-18NPT with additional connection manifold
Direct mounting . . . . . . . . . . Instead of the output y1, an air connection on the back with O-ring will be used (closed at NAMUR mounting).

Electrical Connection
Line entry . . . . . . . . . . . . . . 1 or 2 cable glands 1/2-14 NPT or M20 x1.5 (others with Adapter AD-...)
Cable diameter . . . . . . . . . . . . 6 to 12 mm (0.24 to 0.47 in)
Screw terminals . . . . . . . . . . . . 2 terminals for input, 4 terminals for additional inputs / outputs;
Tightening torque . . . . . . . min. 0.5 Nm, max. 0.6 Nm
Wire cross section . . . . . . . . . . solid wire 0.5 to 6 mm² stranded wire 0.5 to 4 mm²
Crimped wire . . . . . . . . . . . . 0.5 to 2.5 mm² (AWG 21-14)
Test sockets . . . . . . . . . . . . integrated in terminals, for options and communicator connection

Ambient conditions
Operating conditions . . . . . . acc. to IEC 654-1
The device can be operated at a class Dx location
Ambient temperature
Operation 1) . . . . . . . . . . . . –40 to 80 °C (–40 to 176 °F)
Transport and storage . . . . –40 to 80 °C (–40 to 176 °F)
If the device is exposed to sunlight and the temperature may rise above 80 °C, we recommend a sun shade.

Storage conditions
acc. to IEC 60721-3-1: . . . . . . 1K5; 1B1; 1S3; 1M2
Indicators
LCD (visible) 2) . . . . . . . . . . –25 to 70 °C (–13 to 176 °F)
LEDs (if present). . . . . . . . . . –40 to 80 °C (–40 to 176 °F)
Relative humidity . . . . . . . . . up to 100 %
Protection class 3) . . . . . . . . . .
acc. to IEC 60529. . . . . . . . . . IP 66
acc. to NEMA. . . . . . . . . . Type 4X

Electromagnetic compatibility EMC
Operating conditions . . . . . . industrial environment
Immunity according to
EN 61326 . . . . . . . . . . . . . . fulfilled
IEC 61326 . . . . . . . . . . . . . . fulfilled
EN 61000-6-2 . . . . . . . . . . . . . . fulfilled

Emission according to
EN 61326
Class A and Class B . . . . . fulfilled
EN 61000-6-4 . . . . . . . . . . . . . . fulfilled
EN 55011 Group 1,
Class A and Class B . . . . . fulfilled
NAMUR recommendation
EMV NE21 . . . . . . . . . . . . . . fulfilled

SAFETY REQUIREMENTS

CE label
Electromagnetic Compatibility 4) . . . . . . 2004/108/EC
Low-voltage regulation . . . . . not applicable

Safety
According to EN 61010-1
(or IEC 61010-1) . . . . . . Safety class III
Overvoltage Category I
Internal fuses . . . . . . . . . . . . only with PROFIBUS or FOUNDATION Fieldbus, but not replaceable
External fuses . . . . . . . . . . . . Limitation of power supplies for fire protection must be observed acc. to EN 61010-1, appendix F (or IEC 61010-1).

1) Details see Certificates of Conformity.
With Limit Switches Code T only –20 °C.
With Limit Switches Code R only –25 to 70 °C
2) Below –20 °C the LCD reacts only slowly; above 70 °C the background becomes dark
3) Under service as directed
4) With PROFIBUS or FOUNDATION Fieldbus only, if shield of wiring is grounded on both sides
5) Pneumatic connection 1/4-18 NPT made with a seperate manifold delivered together with the device
Electrical classification 1) 2)  
See Certificates of Conformity EX EVE0105 A

Type of protection “Intrinsically Safe” 
ATEX / IECEx
Marking ........................................ Ex ia IIC T4 Gb,
                                      Ex ia IIC T6 Gb

Temperature classes
Version with HART communication and "without communication":
  T4  with explosion protection code EA4
Version with communications HART, FOUNDATION Fieldbus and 
PROFIBUS-PA:
  T4 / T6  with explosion protection code EAA
Certificate of Conformity ......... IECEx EPS 16.0034
                                      EPS 16 ATEX 1 083

For use in hazardous areas in circuits certified as intrinsically safe with the following maximum values:

<table>
<thead>
<tr>
<th>Profibus / Fieldbus</th>
<th>HART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ui</td>
<td>24 V DC</td>
</tr>
<tr>
<td>li</td>
<td>380 mA</td>
</tr>
<tr>
<td>Pi</td>
<td>5.32 W</td>
</tr>
<tr>
<td>Ci</td>
<td>1.3 nF</td>
</tr>
<tr>
<td>Li</td>
<td>5 µH</td>
</tr>
</tbody>
</table>

Ci: effective inner capacity
Li: effective inner inductivity

The supply connections have an inner capacity of max. 5.3 nF opposite the ground.

Ambient temperature ranges:
Temperature class T4:  . . . . –40 °C to 80 °C
Temperature class T6:  . . . . –40 °C to 55 °C

Explosion protection Zone 2 / 22
Installation of the SRD991 in potentially explosive atmospheres for Zone 2 / 22 (explosion protection II 3 G/D Ex ic Gc/Dc)

The Intelligent Positioner SRD991 in protection level intrinsic safety “ic” (II 3 G/D Ex ic Gc/Dc) can also be operated in potentially hazardous areas of Zone 2 / 22.

Explosion protection Zone 20
EX II 1D Ex ia IIIC T 100°C Da. . . . . . –40 °C < T_s < 100 °C

Electrical Data
Supply circuit in type of protection Intrinsic safety Ex ia.

The positioner type SRD991 fulfills the requirements of explosion protection for the Equipment Group II and Category 1D in type of protection Intrinsic safety for dust with a maximum surface temperature of 100 °C.

FM Type of protection
IS / I,II,III / 1 / ABCDFG / T4 Ta = 80°C, T6 Ta = 55 °C
Entity; Type 4X; DOKZ 534 396 049
Ni / I / 2 / ABCD; S / II,III / 2 / FG / T4 Ta = 80 °C, T6 Ta = 55 °C; Type 4X

CSA
PROCESS CONTROL EQUIPMENT-Intrinsically Safe, 
Entity - For Hazardous Locations
Class I, Groups, A, B, C and D; Class II, Groups E, F and G; Class III:
Ex ia IIC T4/T6 IP65:
  • SRD 991 HART/4-20mA/FOXCOM/Profibus/Fieldbus-
    abcdefgh-j Positioner: 12-36 V dc, 4-20 mA or < 48 V dc, 
    Intrinsically safe when installed as per submittor’s
    Dwg DOKZ 534 396 067 or DOKZ 534 396 076; Temp.
    Code T4 at Max Amb. 80C or T6 at Max Amb. 55C.
Note: Model No is followed by suffix abcdefgh-j denoting
    minor mechanical differences and options not affecting
    safety.

With Electrical Classification ATEX + Zone 20 Dust, Codes 
ED4 and EDA, the Travel indicator is not visible.

1)    With appropriate order only
2)    National requirements must be observed
3)    Standard has been replaced by a new standard or revision. The products 
      are according to these new standards or revisions, because the modified 
      requirements are not relevant.
SRD991 with HART communication
SRD991-xHxxxx

Signal Input . . . . . . . . . . . . . Two wire system
Reverse polarity protection . . standard feature
Signal range . . . . . . . . . . . . 4-20 mA
Operating range . . . . . . . . . . 3.6 to 21.5 mA
Input voltage . . . . . . . . . . . . DC 12 to 36 V ¹ (unloaded)
Load . . . . . . . . . . . . . . . . . . 420 Ohms, 8.4 V at 20 mA
Communication signal . . . . . HART, 1200 Baud, FSK
(Frequency Shift Key)
modulated on 4-20 mA
0.5 Vpp at 1 kOhm load

Input impedance Zᵢ . . . . . . . . Z = 320 Ohms
for ac voltage 0.5 to 10 kHz with < 3 dB non-linearity
Cable capacity and inductance see HART standard
specifications (e.g. C < 100 nF).
Impedance of other devices at the input (parallel or serial)
must be within HART spec.
Applications without communication require not to exceed
input capacitance parallel to the input not higher than 100 µF.
Start-up time . . . . . . . . . . . . approx. 3 sec
Interruption time without power down:
with LCD . . . . . . . . . . . . . typ. 80 ms ²)

Configuration
The SRD991 can be configured via HART by any host
system whatever is a PC with a HART Modem, Hand
Held Terminal or a DCS.

LOCAL (by means of local key pad and LCD display)
See page 6

DTM (Device Type Manager)
We are a leading company in term of FDT-DTM technology
http://www.fdtgroup.org/product-catalog/certified-dtms?com-
pany=Foxboro+Eckardt+GmbH&field_device_type_value_
many_to_one=All&field_protocol_value_many_to_one=All
Therefore we provide a DTM fully certified for its inter-
operability and with the state-of-the-art presentation and
diagnostics features.
The DTM can be downloaded from our homepage.

DD (Device Description) and
EDD (Enhanced Device Description)
In case the host system is not supporting the FDT-DTM
technology, you can download the DD and/or EDD from our homepage.

¹) On request we can specify higher voltage limits
²) Worst case conditions 4-20 mA, with position feedback option, i/p-output
with max. current.
SRD991 with communication PROFIBUS-PA and FOUNDATION Fieldbus H1
SRD991-xPxxxx or SRD991-xQxxxx

PROFIBUS-PA
Data transfer . . . . . . . . . . . . according to PROFIBUS- PA profile class B based on EN 50170 and DIN 19245 part 4
GSD file . . . . . . . . . . . . . . . .the actual file can be downloaded from our homepage

Configuration
Local / Display . . . . . . . . . . . see page 6
Software . . . . . . . . . . . . . . . VALcare™ -DTM
Hardware . . . . . . . . . . . . . . . PC- or PCMCIA- interfaces from Softing
I/A Series System . . . . . . . . . FBM 223 in combination with CP60
Other control systems . . . . . All Profbus-PA- compatible, e.g. Siemens SIMATIC PDM (Process Device Manager)

FOUNDATION Fieldbus H1
Data transfer . . . . . . . . . . . . FF Specification Rev. 1.4, Link-Master (LAS)
Two revisions of Firmware can be selected for the FOUNDATION Fieldbus devices in the model code of the positioner. The selection of the Firmware revision is depending of the DCS compatibility, the DD Files already installed in the DCS and the installed base on your site.
Double check interoperability of following characteristics with your DCS before ordering!
When selected Firmware FF16 in the model code :
Certified according to . . . . . . . . . ITK 4.6
Function Blocks . . . . . . . . . . . PID, AO, 2xDI, 1xDO, Transducer, Resource
When selected Firmware FF18 in the model code :
Certified according to . . . . . . . . . ITK 6.0.1
Function Blocks . . . . . . . . . . . PID, AO, 4xDI, 1xDO, IS, OS, AI, MAI, Transducer, Resource
Additional functionality . . . . . . Flat Addressing
DD files . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . the actual file can be downloaded from our homepage

For both fieldbus devices
Input signal . . . . . . . . . . . . . digital
Supply voltage . . . . . . . . . . . DC 9 to 32 V \(^1\)
max. Supply voltage . . . . . . . DC 36 V
Operating current . . . . . . . . . 10.5 mA ± 0.5 mA (base current)
Current amplitude . . . . . . . . ± 8 mA
Fault current . . . . . . . . . . . . . Base current + 0 mA (base current + 4 mA by means of independent FDE-safety circuit) according to IEC 1158-2
Operating values . . . . . . . . . according to IEC 1158-2
Start-up time (init phase) . . . . approx. 2 sec
Bus connection . . . . . . . . . . . Fieldbus interface based on IEC 1158-2 according to FISCO-Model
Power supply . . . . . . . . . . . . . Power supply is achieved dependant on the application by means of fieldbus power supply units or segment coupler

Electrical classification thereto
see page 9

SRD991 without communication
SRD991-xDxxxx
Signal Input . . . . . . . . . . . . . Two wire system
Reverse polarity protection . . . Standard feature
Signal range . . . . . . . . . . . . . 4-20 mA
Operating range . . . . . . . . . 3.6 to 21.5 mA
Input voltage . . . . . . . . . . . . DC 8.5 to 36 V \(^2\) (unloaded)
Load . . . . . . . . . . . . . . . . . 300 Ohms, 6 V at 20 mA
With applications without communication the capacity parallel to input may not be higher than 100 µF.
Start-up time . . . . . . . . . . . . . approx. 3 sec
Interruption time without power down:
with LCD . . . . . . . . . . . . . typ. 80 ms \(^3\)

Configuration
Local / Display . . . . . . . . . . . see page 6
Software . . . . . . . . . . . . . . . VALcare™ (DTM)
Hardware . . . . . . . . . . . . . . . per modem EDC82

Electrical classification thereto
see Page 9

---

1) Data of "Intrinsically Safe" version
2) On request we can specify higher voltage limits
3) Worst case conditions 4-20 mA, with position feedback option, i/p-output with max. current
OVERVIEW ADDITIONAL EQUIPMENT
(built into any basic device)

Built-in Pressure sensors for
Premium Diagnostic, Code Option –B
For supply air and output y1 to actuator
Measuring range . . . . . . . . . 0 to 8 bar (0 to 120 psig)
Accuracy . . . . . . . . . . . . . . . 2 %
Temperature influence . . . . . 0.5 % / 10 K (–40 to 80 °C)

Additional Inputs / Outputs:
One module “Additional inputs / outputs” 8 can be plugged onto main electronics 40:

- 2 Binary inputs or
- 2 Binary in/outputs or
- Position feedback and Alarm
Details see following pages.

Built-in Limit Switch
Details see page 19

Parts Kits for additional installation of auxiliary functions

<table>
<thead>
<tr>
<th>Model codes, Additional inputs / outputs</th>
<th>Supply</th>
<th>Parts Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code B: 2 Binary inputs (Contact inputs)</td>
<td>internal</td>
<td>EW 411 407 325</td>
</tr>
<tr>
<td>Code E: 2 Binary in/outputs</td>
<td>external</td>
<td>EW 411 407 956</td>
</tr>
<tr>
<td>Code F: Position feedback 4-20 mA and Alarm (ATEX)</td>
<td>external</td>
<td>EW 426 434 228</td>
</tr>
</tbody>
</table>

Model codes, Limit signal switches

| Code T: Limit signal switch, normal version | external | EW 426 164 012 |
| Code U: Limit signal switch, security version | external | EW 426 164 021 |
| Code R: Limit signal switch, 3-wire        | external | EW 426 164 057 |
| Code V: Limit signal switch, micro switches | external | EW 426 164 066 |
| Code D: Entry for remote potentiometer     | internal | EW 426 164 093 |
Additional Inputs / Outputs:

Two Binary (Contact) inputs – Code B

Two independent binary inputs, supplied with the basic device, for connection of external switches.

A connected switch is loaded with 3.5 V, 150 μA.

This option 'Binary inputs' can also be used to activate PST (Partial Stroke Test).

The binary inputs can be used for diagnostics or are also configurable for the control functions:

<table>
<thead>
<tr>
<th>Switch 1</th>
<th>Switch 2</th>
<th>Actuator control function</th>
</tr>
</thead>
<tbody>
<tr>
<td>close</td>
<td>close</td>
<td>normal operation</td>
</tr>
<tr>
<td>open</td>
<td>close</td>
<td>go to stop at 0 %</td>
</tr>
<tr>
<td>close</td>
<td>open</td>
<td>go to stop at 100 %</td>
</tr>
<tr>
<td>open</td>
<td>open</td>
<td>hold last position</td>
</tr>
</tbody>
</table>

Terminals for EB1 . . . . . . . . K2/1 + : 13
K2/2 – : 14
EB2. . . . . . . . K3/1 + : 15
K3/2 – : 16

For further information about the contact inputs please consult TI EVE0105 B.

Electrical Classification ATEX / IECEx

Types of protection and temperature classes of basic device, see page 9.

Additions for this option in EC-Certificate of Conformity IECEx EPS 16.0034 and EPS 16 ATEX 1 083:

To this electric circuit only passive electric circuits galvanically separated from earth may be attached.

The electric circuit has the following maximum values:

Uo= 7.88 V, Io= 11.4 mA, Po= 23 mW

Characteristic is linear.

For the maximum values of outer inductances and capacities Lo and Co refer to the following table (Li and Ci included):

<table>
<thead>
<tr>
<th>IIC</th>
<th>IIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lo [mH]</td>
<td>Co [µF]</td>
</tr>
<tr>
<td>100</td>
<td>0.72</td>
</tr>
<tr>
<td>10</td>
<td>1.1</td>
</tr>
<tr>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>0.1</td>
<td>2.7</td>
</tr>
<tr>
<td>0.01</td>
<td>4.7</td>
</tr>
</tbody>
</table>

The electric circuits of "2 binary inputs" are galvanically connected with all other circuits and isolated from earth.

DTM Configuration window
**Additional Inputs / Outputs:**

**Two binary in/outputs** – Code E

This option board is recommended for PST applications.

**Output:**

2 galvanically separated signals
Limit signals / alarms freely configurable via local keys or via communication.
Two-wire system, according to DIN 19234, for external supply.
supply voltage . . . . . . . . . . . DC 8 to 36 V [1] 2)

Configured as NAMUR signal:
Logic:
Limit value not exceeded . . . < 1 mA
Limit value exceeded . . . . . . . typ. 6 mA
Device fault . . . . . . . . . . . . < 50 µA

Configured as On/Off signal:
Limit value not exceeded . . . < 50 µA
Limit value exceeded . . . . . . . > 20 mA/20 V / > 40 mA/10 V
(power derated)
Reference: AB1 for upper, AB2 for lower limit value
Terminals for AB1 . . . . . . . . K2/1 + : 81
K2/2 – : 82
AB2 . . . . . . . . K3/1 + : 83
K3/2 – : 84

**Input:**
The kind of Signals Input can be configured as On/Off or as NAMUR signal in accordance to (DIN 19234)

Configured as NAMUR signal:
Unloaded supply voltage . . . > 8 V
Input:
Logic 0 . . . . . . . . . . . . . . . . . > 0.35 mA, < 1 mA
Logic 1 . . . . . . . . . . . . . . . . . > 2.2 mA, < 6 mA
Input current Limited to . . . . approx. 6 mA

Configured as On/Off signal:
Input:
Logic 0 . . . . . . . . . . . . . . . . . < 4 mA
Logic 1 . . . . . . . . . . . . . . . . . > 6 mA
Signal Voltage Range . . . . . . . 8 to 36 V [1]

**Electrical Classification ATEX / IECEx:**
Types of protection and temperature classes as basic device, see page 9.
Additions for this option in EC-Certificate of Conformity
IECEx EPS 16.0034 and EPS 16 ATEX 1 083:
For use in hazardous areas in circuits certified as intrinsically safe with the maximum values as described in the Certificate of Conformity in chapter “Option UNI-IO”.
The circuits Channel 1 and Channel 2 are electrically safe separated from each other, from all other external circuits and from earth.

---

1) Other values in hazardous areas
2) On request we can specify higher voltage limits
Additional Inputs / Outputs: – Code F

Position feedback 4-20 mA and Alarm
with electrical classification ATEX / IECEx

Stroke / angle derivated from positioner feedback
1 output analog, galvanically separated, two-wire system
according to DIN 19234, for external supply
Supply voltage . . . . . . . . . DC 8 to 36 V 1) 2)
Signal range . . . . . . . . . . 3.8 to 20.5 mA
0 % and 100 % configurable
Device fault . . . . . . . . . . < 50 µA
Terminals for AI . . . . . . . . K3/1 + : 83
K3/2 – : 84
Feedback signal can be reversed (20 --> 4 mA).

1 binary alarm output, galvanically separated, two-wire
system, according to DIN 19234, for external supply
Supply voltage . . . . . . . . . external, DC 8 to 36 V 1) 2)
Logic . . . . . . . . . . . . . . no alarm . . . < 1 mA
alarm . . . . . . . . . . . . > 3 mA
device fault < 50 µA
configurable as switch output:
Limit value not exceeded . . . < 50 µA
Limit value exceeded . . . . > 20 mA/20 V / > 40 mA/10 V (power derated)
Terminals for AB1 . . . . . . . . K2/1 + : 81
K2/2 – : 82
The binary output for Alarm will be activated in the following
cases:
- Remaining control deviation
- Circuit to I/P module is disturbed
- Circuit to potentiometer is disturbed
- Calibration error:
  - no angle calibration
  - no current calibration
- Autostart failed
These pre-settings can be configured via communication
with the Alarm Link function in the DTM.

Electrical Classification ATEX / IECEx:
Types of protection and temperature classes as basic device,
see page 9.
Additions for this option in EC-Certificate of Conformity
IECEx EPS 16.0034 and EPS 16 ATEX 1 083:

For use in hazardous areas in circuits certified as intrinsically
safe with the maximum values as described in the
Certificate of Conformity in chapter “Option UNI-IO”.
The circuits Channel 1 and Channel 2 are electrically safe
separated from each other, from all other external circuits
and from the earth.

1) Other values in hazardous areas
2) On request we can specify higher voltage limits
Entry for remote potentiometer
(for remote mounting main unit)
– Code D

This remote application is used in applications where high temperatures or vibration are present and can result in negative influences to the control. It can also be used in places not easy to reach, to ensure an easier handling of the unit, or for cylinders with large strokes.

The Positioner SRD991 (Remote unit) is mounted far away from the valve or cylinder in a safe environment.

The Potentiometer unit is mounted on the valve or cylinder. This potentiometer unit can be made of a derivative version of the SRI990 positioner (only potentiometer in the housing) or of an external potentiometer like a linear potentiometer for application onto cylinders, for example.

This option is to be used with a potentiometer unit 3 wires system with approx. 5 kOhm resistance.

If the following requirements are observed, the set-up is insensitive to electrical disturbances caused by high electromagnetic fields, EMC and HF-radiation.

Cable Length max. . . . . . . . . 10 m (32 ft)

Cable Specification (not supplied by us):
• 3-wire twisted pair, shielded
• Shield needs to be connected on both ends to the internal ground
• Shield endings need to be kept very short when connecting to the ground
• A HF cable gland is not required

For more information about remote mounting please consult TI EVE0105 R.

Note: The functionality and certifications are only ensured with our 5 kOhm potentiometer.

Electrical Classification ATEX / IECEx:

Types of protection and temperature classes as basic device, see page 9.

Additions for this option in EC-Certificate of Conformity IECEx EPS 16.0034 and EPS 16 ATEX 1 083:

For use in hazardous areas in circuits certified as Intrinsically Safe with the following maximum values:

\[
\begin{align*}
U_{\text{max}} & = 6.5 \text{ V} \\
I_{\text{supply}} & = 25 \text{ mA} \\
I_{\text{wiper}} & \leq 1 \text{ mA} \\
P_{\text{total}} & \leq 40 \text{ mW}
\end{align*}
\]
**Built-in Limit Switches**

Stroke / angle derived from positioner feedback
- Standard version (SJ2-N) ....... Code T (only to –20°C)
- Security version (SJ2-SN) ..... Code U
- 3-wire (SI2-K08-AP7/ PNP) ... Code R (no Ex, –25 to 70 °C)
- Micro switches (V4NS) ......... Code V (no Ex)
- Entry for remote potentiometer Code D

**Materials**

Control vanes ...................... Aluminum
Transmission shaft ................. 1.4571
Inductive Limit Switch (Code T, U)
Output . . . . . . . . . . . . . . . . . . 2 inductive proximity sensors acc. to DIN 19 234 or NAMUR for connection to switching amplifier 1)
Current consumption
Vane clear . . . . . . . . . . . . . > 2.2 mA
Vane interposed . . . . . . . . < 1 mA
for control circuit with the following electrical values:
Supply voltage . . . . . . . . . DC 8 V, R, approx. 1 kOhm
Supply voltage range . . . . . . DC 5 to 25 V (with "no Ex")
Residual ripple . . . . . . . . < 10 % p.p.
Permissible line resistance . . . . < 100 Ohms
Response characteristic 2) 3)
Switching differential . . . < 1 %
Switching point repeatability < 0.2 %
Terminals for GW1 . . . . . . . . 41+, 42–
GW2 . . . . . . . . 51+, 52–

Electrical Classification ATEX / IECEx of versions "T" and "U":
Types of protection and temperature classes as basic device, see page 9.
Additions for this option in EC-Certificate of Conformity IECEx EPS 16.0034 and EPS 16 ATEX 1 083:
For use in hazardous areas in circuits certified as Intrinsically Safe with the following maximum values:
Ui= 16 V, Ii= 25 mA, Pi= 64 mW
Internal capacitance and inductance: Ci= 30 nF, Li= 100 µH
The electric circuits of "Built-in Limit Switch" are galvanically separated from all other circuits and from earth.

Mechanical Switches (Micro Switches) Code V
Output . . . . . . . . . . . . . . . . . . 2 mechanical switches
(without Ex protection)
Stroke / angle derived from positioner feedback lever
Current consumption
Vane clear . . . . . . . . . . . . . > 2.2 mA
Vane interposed . . . . . . . . < 1 mA
for control circuit with the following electrical values:
Supply voltage . . . . . . . . . DC 10 to 30 V
Residual ripple . . . . . . . . ± 10 %, Us = 30 V
Switching frequency . . . . . . 2 kHz
Constant current . . . . . . . . 100 mA
Response characteristic
Gain . . . . . . . . . . . . . . . . . . continuously adjustable
from 1:1 to approx. 7:1
Switching differential . . . < 1 %
Switching point repeatability . . . < 0.2 %
Terminals for GW1 . . . . . . . . 41, 42
SW2 . . . . . . . . . . . . . . . 51, 52

Inductive Limit Switch, three-wire system
– Code R
Input . . . . . . . . . . . . . . . . . . Stroke / angle from actuator via positioner feedback lever
Output . . . . . . . . . . . . . . . . . . 2 inductive proximity sensors, three-wire system,
LED indication, contact, pnp 7)
Supply voltage Us . . . . . . . . DC 10 to 30 V
Residual ripple . . . . . . . . ± 10 %, Us = 30 V
Switching frequency . . . . . . 2 kHz
Constant current . . . . . . . . 100 mA
Response characteristic 9)
Gain . . . . . . . . . . . . . . . . . . continuously adjustable
from 1:1 to approx. 7:1
Switching differential . . . < 1 %
Switching point repeatability . . . < 0.2 %
Terminals for GW1 . . . . . . . . 41, 42
GW2 . . . . . . . . . . . . . . . 51, 52

5) Operating mode min. (=low) / max. (=high) selectable by adjusting the respective vane
6) Operating mode normally open / normally closed selectable by vane adjustment
7) Approval according to UL (UL 1054) and CSA (CSA 22.2 No. 55) at 6,000 operations and T = 65 °C / 149 °F
8) Based on EN 61058-1, at 10,000 operations and T = 85 °C / 185 °F
9) General rating at 50,000 operations and T = 85 °C / 185 °F

1) Operating mode min. (=low) / max. (=high) selectable by adjustment of switch vanes
2) Data measured according to VDI/VDE 2177
3) With stroke 30 mm and lever length 90 mm

5) Operating mode min. (=low) / max. (=high) selectable by adjusting the respective vane
6) Operating mode normally open / normally closed selectable by vane adjustment
7) Approval according to UL (UL 1054) and CSA (CSA 22.2 No. 55) at 6,000 operations and T = 65 °C / 149 °F
8) Based on EN 61058-1, at 10,000 operations and T = 85 °C / 185 °F
9) General rating at 50,000 operations and T = 85 °C / 185 °F
FUNCTIONAL DESIGNATIONS

1a Adapter, eg. 1/2"-14 NPT
1b Cable gland
2 Plug, interchangeable with Pos. 1
3 Screw terminals (11 / 12) for input (w)
or for bus connection IEC 1158-2
3a Screw terminals (3) for additional inputs / outputs
3b Test sockets Ø 2 mm, integrated in terminal block
4 Ground connection
5 Female thread (g) 1/4 -18 NPT or output I (y1)
6 Female thread (g) 1/4 -18 NPT for air supply (s)
7 Female thread (g) 1/4 -18 NPT or output II (y2)
8 Direct attachment hole for output I (y1)
9 Feedback shaft
10 Connection manifold for attachment to stroke actuators
   (not with VDI/VDE 3847 version)
11 Connection base for attachment to rotary actuators
12 Travel indicator
13 Key UP
14 Key DOWN
15 Key M (Menu)
16 Status display (1 red LED, 4 green LEDs)2)
16a LCD with true text in 3 different languages
19 Fixing shaft for limit switch
20 Cover with window to 12
21 Air vent, dust and water protected
22 Data label
26 Arrow is perpendicular to shaft 9 at angle 0 degree
27 Ball valve for protection class NEMA 4X
28 High cover with built-in limit switch
29 Plug for service connector 3)

G) With marked letter "G" in the housing the pneumatic connecting
   threads are cut as G 1/4 instead of 1/4-18 NPT
1) Alternatively Cage clamps (WAGO) instead of screw terminals
2) Depending on the version, the device is equipped with or without LEDs
### Intelligent Positioner SRD991

<table>
<thead>
<tr>
<th>Version</th>
<th>SRD991</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Acting</td>
<td>-B</td>
</tr>
<tr>
<td>Double Acting</td>
<td>-C</td>
</tr>
</tbody>
</table>

#### Input/Communication
- Intelligent without communication (4 - 20 mA) | D |
- HART Communication (4 - 20 mA) | H |
- PROFIBUS-PA (acc. to FISCO) | P |
- FOUNDATION Fieldbus H1 (incl. PID-Fct. Block, acc. to FISCO) | Q |

#### Additional Inputs/Outputs
- Prepared For Additional In-/Outputs | N |
- Binary Inputs | B |
- Binary Inputs-Outputs (mandatory for ESD application) | E |
- Position Feedback 4 - 20 mA and one Binary Output for Alarm | F |

#### Built-In Limit Switch
- Without Built-In Limit Switch | S |
- Inductive Limit Switch - Intrinsically Safe (Standard Version SJ2-N) | T |
- Inductive Limit Switch - Intrinsically Safe (Security Version SJ2-SN) | U |
- Inductive Limit Switch - Three wire version | R |
- Mechanical Switches (Micro-Switches) / UL- and CSA-approved | V |
- Potentiometer Input - CEM Filter (for Remote Mounting - main unit) | D |

#### Cable Entry
- M20 x 1.5 Without Cable Gland | 1 |
- 1/2"-14 NPT (with Adapter(s) M20x1.5 to 1/2"-14 NPT) | 6 |
- M20 x 1.5 With One Plastic Cable Gland | 7 |

#### Electrical Classification
- Without Ex | ZZZ |
- for Input/Communication D, H | (y) |
- for Input/Communication H, F | (x) |
- II 2 G Ex ia IIC T4 Gb according to ATEX / IECEx | EA4 |
- II 2 G Ex ia IIC T6 Gb according to ATEX / IECEx | EAA |
- II 3 G/D Ex ic T4 Gc/Dc according to ATEX | 2C4 |
- II 3 G/D Ex ic T6 Gc/Dc according to ATEX | 2CA |
- II 2 G Ex ia IIC T4 Gb + II 1D Ex iaD 20 T100°C Da acc. to ATEX / IECEx | ED4 |
- II 2 G Ex ia IIC T6 Gb + II 1D Ex iaD 20 T100°C Da acc. to ATEX / IECEx | EDA |

#### Attachment Kit
- Order as Auxiliary | N |

#### Manifold
- Pneumatic connection 1/4 - 18 NPT made of an additional manifold | Y |
- Pneumatic connection G 1/4 | R |
## OPTIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium Diagnostics Features (made with built-in Pressure Sensors)</td>
<td>(v)</td>
</tr>
<tr>
<td>Positioner free of copper and its alloys</td>
<td>(h)</td>
</tr>
<tr>
<td>Pneumatic Amplifier in the &quot;Spool Valve&quot; Version</td>
<td>(n)</td>
</tr>
<tr>
<td>Approved for SIL2 / SIL3 application</td>
<td>(w)</td>
</tr>
<tr>
<td>Custom Configuration</td>
<td>(T)</td>
</tr>
<tr>
<td>Version of Positioner according to VDI/VDE 3847</td>
<td>(a)</td>
</tr>
<tr>
<td>Rotating angle up to 300 °</td>
<td>(J)</td>
</tr>
<tr>
<td>Stainless Steel Housing without SST gauges</td>
<td>(m)</td>
</tr>
<tr>
<td>Stainless Steel Housing 10 bar supply</td>
<td>(f)</td>
</tr>
<tr>
<td>Top Mounting version of SRD991 with built-in linear potentiometer</td>
<td>(y)</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / French</td>
<td>-W</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Spanish</td>
<td>-ZK1</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Portuguese</td>
<td>-ZK</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Polish</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Czech</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Italian</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Turkish</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Swedish</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Finnish</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Chinese</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Russian</td>
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<tr>
<td>LCD with Menu-Language in English / German / Hungarian</td>
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<tr>
<td>LCD with Menu-Language in English / German / Serbian</td>
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<tr>
<td>LCD with Menu-Language in English / German / Dutch</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Romanian</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Lithuanian</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Chinese</td>
<td>-Z</td>
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<tr>
<td>LCD with Menu-Language in English / German / Russian</td>
<td>-Z</td>
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<tr>
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<td>-Z</td>
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<tr>
<td>LCD with Menu-Language in English / German / Serbian</td>
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<tr>
<td>LCD with Menu-Language in English / German / Dutch</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Romanian</td>
<td>-Z</td>
</tr>
<tr>
<td>LCD with Menu-Language in English / German / Lithuanian</td>
<td>-Z</td>
</tr>
</tbody>
</table>

**Tag No. Labeling**

- Stainless Steel Label Fixed With Wire: -L
- Stainless Steel Housing: -Z
- Stainless Steel Housing without SST gauges: -Z
- LCD with Menu-Language in English / German / French: -W
- LCD with Menu-Language in English / German / Spanish: -V02
- LCD with Menu-Language in English / German / Portuguese: -V03
- LCD with Menu-Language in English / German / Polish: -V04
- LCD with Menu-Language in English / German / Turkish: -V07
- LCD with Menu-Language in English / German / Finnish: -V09
- LCD with Menu-Language in English / German / Russian: -V11
- LCD with Menu-Language in English / German / Hungarian: -V12
- LCD with Menu-Language in English / German / Serbian: -V13
- LCD with Menu-Language in English / German / Dutch: -V14
- LCD with Menu-Language in English / German / Romanian: -V15
- LCD with Menu-Language in English / German / Lithuanian: -V16

(a) ONLY WITH (additional Inputs/Outputs E) AND (Optional Feature -B)
(b) Not released
(c) Only with Input/Communication D, H
(d) Only with Input/Communication F, H, P and Q
(e) NOT WITH (electrical certification ZZZ, EA4, EAA, GA4, GAA)
(f) Available WITH (Version: C) AND (Built-in Limit Switch: S, D) AND (Electrical Classification: ZZZ, EA4, EAA, GA4, GAA, NFM, FAA) OR WITH (Version: B) AND (Built-in Limit Switch: S, D) AND (Electrical Classification: ZZZ, EA4, EAA, GA4, FAA, FAA)
(g) Available ONLY WITH (Electrical Classification: FAA, NFM, CAA)
(h) Available WITH (Version: B) OR WITH (Version: C) AND (Optional Features: S)
(i) ONLY WITH (Built-in limit switch -S) AND (Electrical Classification EAx, NFM, FAA, GAx)
(k) Only with ELECTRICAL CLASSIFICATION EA4, EAA or ZZZ
(l) NOT WITH (optional feature -N OR Z OR Z1)
(m) Available WITH (Version: C) AND (Built-in Limit Switch: S, D) AND (Electrical Classification: ZZZ, EA4, EAA, ED4, GA4, FAA, FAA) AND (Optional Feature -S) NOT WITH (Optional feature -B)
(n) Only with Version -C
(s) Only available with Optional Feature LCD (-V01 to -Vxx) (u) Only with Electrical Classification: ZZZ
(v) Only available for Input/Communication F, H, P and Q in connection with Electrical Classification ZZZ, FAA, NFM, EA4, FAA, GA4, FAA
(w) Only available for Version single-acting -B in connection with Input/Communication -D and -H (x) Only in connection with Optional Features -B
(y) Not with Optional Features -B
(z) Not available with Electrical Classification FAA, NFM and CAA

(1) On request
Accessories, for all basic devices

- **Code LEXG –L** (-K for G1/4)
  Connection manifold

- **Code LEXG –M3**
  Sandwich Manifold with 3 gauges to be mounted together with Volume booster type LEXG-Gx

- **Code LEXG –J** (-J for G1/4)
  Connection manifold for single acting positioner with pressure gauges for supply air s and output y

- **Code LEXG –M** (-M for G1/4)
  Connection manifold for double acting positioner with pressure gauges for supply air s and output y1 and y2

- **Code LEXG –N** (-N for G1/4)
  as –M, M1, but without pressure gauges

* Unused threads for pressure are closed by means of lock screw Part No. 425 024 013
MODEL CODES  Accessories

Accessories for intelligent Positioners

Filter Regulators
Filter Regulator FRS923-2SK Filter Regulator for –40°C to 80°C .......................................................... FRS01
Filter Regulator Filter Regulator for –20°C to 70°C .............................................................................. FRS02
Filter Regulator Stainless Steel (316) Filter Regulator ......................................................................... FRS03
Mounting Bracket for FRS02 or FRS03 ............................................................................................. EBZG-FR1
Orientable Mounting Bracket for FRS02 or FRS03 ........................................................................... EBZG-FR2
Nipple for direct mounting Filter regulator 1/4 NPT both sides.................................................. VG-91

Communication / Modem / DTM
HART USB Modem (made by Ifak) with ATEX IS Certification .......................................................... MOD900
DTM for SRD Serie for HART / FF / Profibus / FoxCom ................................................................... VALCARE
ATEX IS Barrier Rail Mounted Module, 1 Channel, ATEX Ex ia IIC / FM Intrinsically Safe (TV228-SEGX). TV228

Booster Relay
Booster Cv 1 - Alu Housing - Remote mount .................................................................(f) VBS100
Booster Cv 1 - SST Housing - Remote mount .................................................................(g) VBS110
Booster Cv 7 - Alu Housing - Remote mount .................(b) ............................................................ VBS300
Booster Cv 7 - SST Housing - Remote mount .................(b) ............................................................ VBS310
Booster Relay with connection 1/4-18 NPT......................................................................................... LEXG-G
Booster Relay with connection G 1/4 ................................................................................................. LEXG-G1

Surge / Lightning Protection
Surge/Lightning Protection for 4-20 mA with or without HART type TP48-N-NDI ................................ BUSG-L1
Surge/Lightning Protection for FF/Profibus type TP32-N-NDI .......................................................... BUSG-L4

Lock-in Relays
Lock-In Relay for lost of air supply for single acting / NAMUR Mounting ............................................ LEXG-VR1
Lock-In Relay (Fail Freeze) for lost of air supply and electric power for single and double acting /
SRI990 direct mounting ................................................................................................................ LEXG-VR6
Lock-In Relay for lost of air supply for single and double acting / direct mounting . ...................... LEXG-VR8

wirelessHART module
WirelessHART Module Type Mactek BULLET for PST Monitoring (no Ex) ...................................... BUSG-WH1
WirelessHART Module Type Mactek BULLET for PST Monitoring (Intrinsically Safe ATEX+FM) .......... BUSG-WH2

Cable Gland
Cable Gland, M20x1.5 Plug-Connector For Fieldbus (ss/Thraeded Connection 7/8 - UN) ................ BUSG-F2
Cable Gland, M20x1.5 Plastics, Color Gray / Black ........................................................................ BUSG-K6
Cable Gland, M20x1.5 Plastics, Color Blue .................................................................................. BUSG-K7
Cable Gland, M20x1.5 Plastics, Color White .................................................................................. BUSG-K9
Cable Gland, M20x1.5 Plug-Connector For Fieldbus (ss/Thraeded Connection M12) ....................... BUSG-P3
Cable Gland, M20x1.5 HF For Fieldbus ...................................................................................... BUSG-P4
Cable Gland, M20x1.5 Stainless Steel .............................................................................................. BUSG-S6

Tube Fittings
Tube Fittings, G 1/4 A, 6x1mm , 1 pc......................................................................................... VG-01
Tube Fittings, G 1/4 A, 6x1mm, 2 pcs ............................................................................................ VG-02
Tube Fittings, G 1/4 A, 6x1mm, 3 pcs ............................................................................................ VG-03
Tube Fittings, 1/4 NPT, 6x1mm, 2 pcs ............................................................................................ VG-52
Tube Fittings, 1/4 NPT, 6x1mm, 3 pcs............................................................................................ VG-53

Adapter
Adapter (Brass With Nickel Coating) M20 x 1.5 to 1/2 - 14 NPT (Internal Thread).......................... AD-A5
Adapter (ss) M20x1.5 to 1/2-14 NPT (Internal Thread) .................................................................. AD-A6
Adapter (ss) M20x1.5 to G 1/2" (Internal Thread) ........................................................................ AD-A8
Adapter (Plastic) M20x1.5 to PG13.5 (Internal Thread) ................................................................ AD-A9
### MODEL CODES  Attachment kits

<table>
<thead>
<tr>
<th>ACCESSORIES FOR POSITIONER (SRD991, SRI990, SRD960)</th>
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</thead>
<tbody>
<tr>
<td><strong>Attachment Kit</strong></td>
</tr>
<tr>
<td>For diaphragm actuators with casting yoke acc. NAMUR (incl. standard Couple lever)</td>
</tr>
<tr>
<td>For diaphragm actuators with pillar yoke acc. NAMUR (incl. standard Couple lever)</td>
</tr>
<tr>
<td>For directly mounting (incl. standard Couple lever)</td>
</tr>
<tr>
<td>For mounting to rotary actuators acc. VDI/VDE 3845 (without bracket)</td>
</tr>
<tr>
<td>For FoxTop/FoxPak</td>
</tr>
<tr>
<td>Brackets VDI/VDE 3845 (A = 130 mm / 5.12 in; B = 50 mm / 1.97 in)</td>
</tr>
<tr>
<td>Brackets VDI/VDE 3845 (A = 80 mm / 3.15 in; B = 30 mm / 1.18 in)</td>
</tr>
<tr>
<td>Brackets VDI/VDE 3845 (A = 80 mm / 3.15 in; B = 20 mm / 0.79 in)</td>
</tr>
<tr>
<td>For Badger Meter - Research Control Series 754 and 755 Size 1/2 inch</td>
</tr>
<tr>
<td>For Fisher 657, 667 (linear) size 30 and 40</td>
</tr>
<tr>
<td>657, 667 size 30 and 60</td>
</tr>
<tr>
<td>657, 667 size 70 and 100</td>
</tr>
<tr>
<td>1051, 1052, 1061 size 40</td>
</tr>
<tr>
<td>1051, 1052, 1061 size 30 and 60</td>
</tr>
<tr>
<td>1051, 1052, 1061 size 60</td>
</tr>
<tr>
<td>For Foxboro P-Series / such as -H with installed height 80 mm (3.15 in)</td>
</tr>
<tr>
<td>NAMUR-Attachment kit for centered mounting position on the casting yoke</td>
</tr>
<tr>
<td>For mounting on ADAR control valve</td>
</tr>
<tr>
<td>Micro flow control valve</td>
</tr>
<tr>
<td>Such as -K with installed height 80 mm (3.15 in)</td>
</tr>
<tr>
<td>For Kinetrol (Actuator Size 05)</td>
</tr>
<tr>
<td>(Actuator Size 07)</td>
</tr>
<tr>
<td>(Actuator Size 09)</td>
</tr>
<tr>
<td>For Metso / Neles Rotary actuators Type AB6 and Type BJ &amp; BC size 8 and 10, B1C11</td>
</tr>
<tr>
<td>Type BJ and BC size 12 and 16, B1C17</td>
</tr>
<tr>
<td>For ARI-Armaturen - Direct Mounting to actuator type DR</td>
</tr>
<tr>
<td>For ARCA - Direct Mounting to actuator type BR 812</td>
</tr>
<tr>
<td>For Samson Type 3277 with 1/4 - 18 NPT</td>
</tr>
<tr>
<td>Type 3277 with G 1/4</td>
</tr>
<tr>
<td>Type 3277 with 1/4 - 18 NPT and gauges for supply and output pressure</td>
</tr>
<tr>
<td>Type 3277 with G 1/4 and gauges for supply and output pressure</td>
</tr>
<tr>
<td>Microflow Type 3277-5</td>
</tr>
<tr>
<td>Tuflin/XOMOX Type MX60</td>
</tr>
<tr>
<td>Type MX200</td>
</tr>
<tr>
<td>Type MX450 / Type MX750 / Type MX1250</td>
</tr>
<tr>
<td>Type MX3000</td>
</tr>
<tr>
<td>For Hagan actuators (left of pneumatic cylinder)</td>
</tr>
<tr>
<td>(right of pneumatic cylinder)</td>
</tr>
<tr>
<td>For AMRI rotary actuator (requires minor modification of actuator. Please consult us before ordering!)</td>
</tr>
<tr>
<td>For Siemens actuators V-Series</td>
</tr>
<tr>
<td>For Sereg Maxflo, Revca, Reglob new type</td>
</tr>
<tr>
<td>Maxflo &quot;old type&quot;</td>
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<tr>
<td>CNX (Flowserve)</td>
</tr>
<tr>
<td>For Masoneilan Type Camflex II</td>
</tr>
<tr>
<td>47/48 (Sigma-F)</td>
</tr>
<tr>
<td>Type 37/38 size 15 and 18 (complete kit)</td>
</tr>
<tr>
<td>Type 87/88 all sizes</td>
</tr>
<tr>
<td>Varipac</td>
</tr>
<tr>
<td>37/38 size 9, 11, 13</td>
</tr>
<tr>
<td>/ Severn Glocon Type Domotor size small</td>
</tr>
<tr>
<td>For Valtek Linear Actuator all Sizes - Stroke up to 4 inch / 102 mm</td>
</tr>
<tr>
<td>For VETEC Type R150</td>
</tr>
</tbody>
</table>

*) We recommend to contact our field service dept. before selection of these mounting kits.
Further Attachment kits on request.
MOUNTING TO LINEAR ACTUATORS
Attachment to stroke actuators acc. to IEC 534-6 (NAMUR), left hand

MOUNTING TO LINEAR ACTUATORS
Direct attachment to stroke actuators
MOUNTING TO LINEAR ACTUATORS
Attachment to stroke actuators acc. to IEC 534-6 (NAMUR), right hand
MOUNTING TO ROTARY ACTUATORS
Delivery of bracket by manufacturer of actuator

DIMENSIONS – Attachment to rotary actuators acc. to VDI/VDE 3845

Attachment diagram of bracket

Linking piece
MOUNTING acc. to VDI/VDE 3847
Mounting to Linear actuators

Mounting to Rotary actuators
DIMENSIONS
Components of Attachment kits (samples)

**Feedback lever** Code EBZG-A for 8 to 70 mm travel

**Feedback lever** Code EBZG-B for 60 to 120 mm travel

**Feedback lever** Code EBZG-E for FlowPak/FlowTop

**Feedback lever** Code EBZG-A1 for 100 to 260 mm travel

**Mounting bracket** e.g. EBZG -H -K

**Carrier bolt** for connection to valve stem

Weights of LEXG manifolds

- LEXG -F = 0.90 kg
- LEXG -F1 = 1.00 kg
- LEXG -G = 1.25 kg
- LEXG -G1 = 1.38 kg
- LEXG -H = 1.40 kg
- LEXG -H1 = 1.55 kg
- LEXG -J/-J1 = 0.40 kg
- LEXG -M/-M1 = 0.45 kg
- LEXG -N/-N1 = 0.28 kg
- LEXG -K = 0.12 kg
DIMENSIONS

*) Dimension with high cover with option "built-in limit switch"
DIMENSIONS INOX  SRD991 in stainless steel housing

Gauges with G 1/8 thread